Maximum Permissible Exposure Evaluation

FCC ID: 2A4RO-M9PRO

1. Client Information

Applicant	:	Shenzhen Amesra Technology Co., Ltd.
Address	:	401, Aohua Business Building, No. 148 Huarong Road, Gaofeng Community, Dalang Street, Longhua District, Shenzhen, China
Manufacturer	:	Shenzhen Amesra Technology Co., Ltd.
Address	:	401, Aohua Business Building, No. 148 Huarong Road, Gaofeng Community, Dalang Street, Longhua District, Shenzhen, China

2. General Description of EUT

EUT Name	:	Bluetooth audio adapter	
Models No.	:	M9 Pro, M3, M3 Pro, M5, M5 Pro, M6, M8, M9, M10, M10 Pro, M13, M13 Pro, M15, M15 Pro, M16, M16 Pro, M18, M18 Pro, M19, M19 Pro, M20, M20 Pro	
Model Difference	:	All PCB boards and circuit diagrams are the same, the only difference is that appearance.	
Product Description	:	Operation Frequency:	Bluetooth V5.3:2402MHz~2480MHz
		Number of Channel:	40 channels
		RF Output Power:	GFSK: 2.641dBm π/4-DQPSK: 2.485dBm 8-DPSK: 2.447dBm
		Antenna Gain:	2dBi External Antenna
Power Rating	:	Input: DC 5V, 1A	
Li-ion Polymer Battery	:	DC 3.7V by 1200mAh Rechargeable Li-ion battery	
Software Version	:	V2.0	
Hardware Version	:	V1.3	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark	:	The antenna gain provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.	

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MPE Calculations for 2.4G

1. **Antenna Gain:**
   External Antenna: 2dBi.

2. **EUT Operation Condition:**
   Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3. **Exposure Evaluation:**
   Equation from page 18 of OET Bulletin 65, Edition 97-01
   $S=(PG)/4\pi R^2$
   Where
   S: power density
   P: power input to the antenna
   G: power gain of the antenna in the direction of interest relative to an isotropic radiator.
   R: distance to the center of radiation of the antenna

4. **Test Result:**

Worst Maximum MPE Result								
Mode	N_{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/cm^2) [S]
GFSK	1	2402	2.641	3±1	4	2	20	0.0008
		2441	2.218	2±1	3	2	20	0.0006
		2480	0.657	1±1	2	2	20	0.0005
π /4-DQPSK	1	2402	2.485	2±1	3	2	20	0.0006
		2441	2.1	2±1	3	2	20	0.0006
		2480	0.537	1±1	2	2	20	0.0005
8-DPSK	1	2402	2.447	2±1	3	2	20	0.0006
		2441	1.945	2±1	3	2	20	0.0006
		2480	0.462	0±1	1	2	20	0.0004

Note:
(1) N_{TX}= Number of Transmit Antennas
(2) RF Output power specifies that Maximum Conducted Peak Output Power.

5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/cm^2)
300-1,500	F/1500
1,500-100,000	1.0

For Bluetooth:2402~2480 MHz

MPE limit S: 1mW/ cm^2

The MPE is calculated as **0.0008 *mW / cm^2 < limit 1mW / cm^2***. So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b).

The RF Exposure Information page from the manual is included here for reference.

Note

For a more detailed features description, please refer to the RF Test Report.

6. Conclusion:

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----END OF REPORT-----